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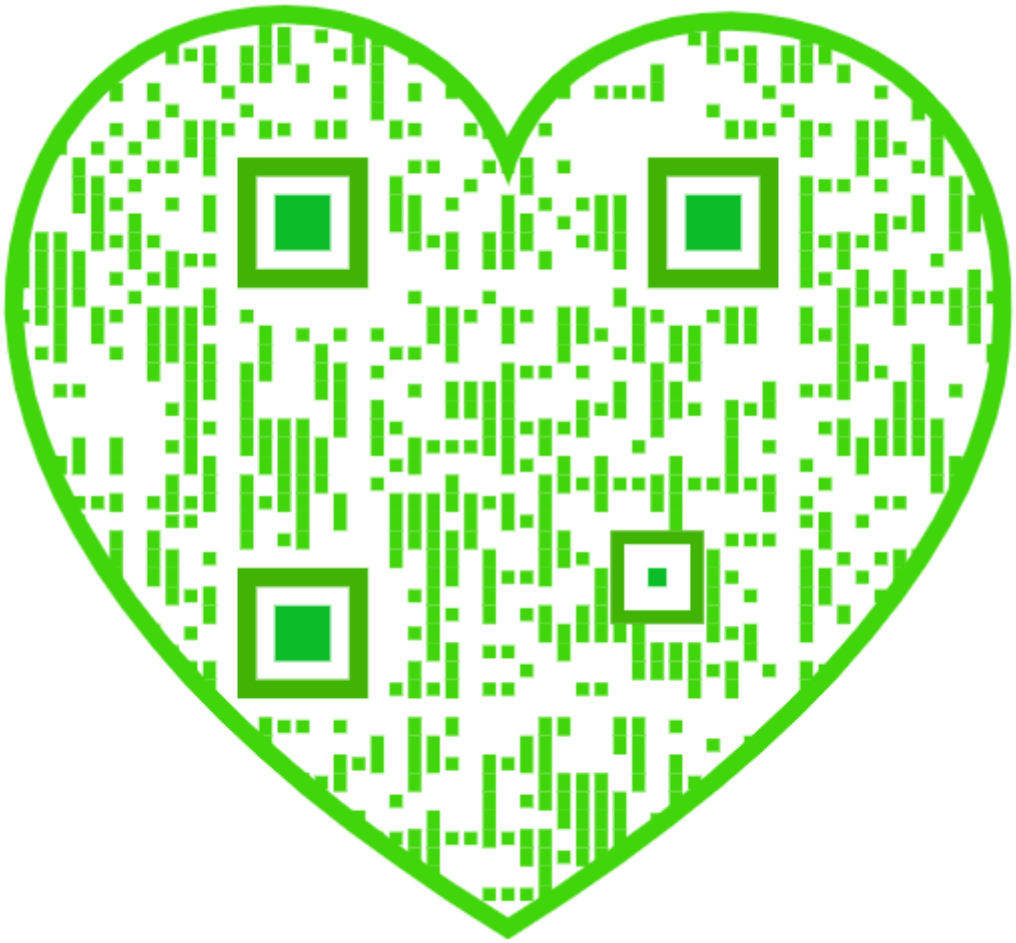

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SHADE TREES,

INDIGENOUS

Shrubs and Vines.

SECOND EDITION.

Revised and Improved,

BY

J. T. STEWART, M. D.

PEORIA, ILL..
TRANSCRIPT PUBLISHING COMPANY, PRINTERS.
1883.

Quercus macrocarpa.

FIRST EDITION.

To My Readers:

The following pages are the result of many years observation and much careful study. Every statement has been maturely considered. There may be, and doubtless are errors, but I am sure a critical examination and the test of experience, will prove them to be few. I have endeavored to put in a small compass as much practical information as possible, on a subject on which much is needed. It was written expressly for this city, though parts of it apply equally to other places.

J. T. STEWART.

SECOND EDITION.

This second and revised edition of Dr. J. T. Stewart's paper on shade trees, indigenous shrubs and vines, was written by request of the Scientific Association of Peoria, and read before it December 22d, 1882.

It is a guide to tree culture in this city. On account of its intrinsic value it is published by and under the auspices of the Association for the Benefit of the City and Surrounding Country.

It is hoped that all will read and appreciate it, as so much valuable and practical information on this subject cannot be obtained from any other source.

Shade Trees.

A little time devoted by every family to the culture of shade trees and ornamental shrubbery would add much to the healthfulness and beauty of our city, and would have a refining and elevating influence upon its people.

A tastefully arranged and nicely kept yard invites every passer-by to a higher and better life, and is a joy to the family forever. The growing children drink in its beauty, and make it a part of themselves as surely and naturally as they breathe their native air. Coarse, unlovely children, brought up in the midst of lovely surroundings, are impossible things.

In earlier ages men planted groves for places of worship. The great, spreading trees, have an inspiring influence. Avenues of trees in cities and in the country relieve the residences of their naked and cheerless aspect, and give them an air of comfort and beauty which a harmonious blending of art and nature always does. A house without a tree has no charms for me. There is no poetry, no romance, no inspiration there. The sylvan god is not there. The goddess of beauty is not there.

The streets in the resident parts of all cities should be arched with trees. This is not difficult to do. It requires care and time, and when accomplished gives to them their crowning glory. What can be finer, or approximate nearer to our ideal paradise than a city robed in the verdure of the forest.

The Hackberry is a medium-sized tree, resembling the Elm; has a medium growth, is clean and symmetrical. When not crowded its top rounds up well and becomes quite dense. Its spray is the most graceful of our forest trees, and it holds its leaves till late in autumn. It is exceedingly tough. Its limbs never break. It will bear any amount of trampling around, and any amount of drouth, heat, cold, dust and smoke. It bears a dark purple, globular stone fruit, about the size of a pea, with a thin, sweet pulp, ripening late in the fall. It is rarely infested with insects. The leaves of young trees, set out in the city, have sometimes been preyed upon by a little insect late in the summer until they drop off, but they come out again without apparent injury to the trees. This I have never seen happen to old trees or to young ones in the forests. I suppose, if we were to plant Canada thistles for ornament or use, something would select them for their victims, and seriously injure, if not destroy them. It grows slowly when small, but when it becomes large enough for transplanting, its growth is fully equal to that of the elm. It requires as much care in transplanting as other trees, but when it is well started it is there forever. In rich, bottom land it becomes a large tree, but in poor, dry soil it only attains to medium size.

The Catalpa has been to me the most perplexing of all trees. It has been planted here more or less for forty years, with varying success; some of the trees flourishing, others dying, and others again growing scragged, presenting a sickly and unsightly appearance. Why this difference? It has been a mystery. But within the last few years the mystery has been solved, chiefly by the observations and labors of Dr. John A. Warder, of North Bend, Ohio; E. E. Barney, of Dayton, Ohio, and Prof. C. S. Sargent, of Harvard Uni-

versity, Cambridge. It has been proven that there are two species in our country, or, at least, two well marked varieties of the Catalpa. They have been denominated the Catalpa *bignonioides* and the Catalpa *speciosa*. The former is a native of Georgia and North Carolina, the latter of Tennessee, Kentucky, Southern Ohio, Indiana, Illinois and Southeastern Missouri. The former is tender here, and the latter is perfectly hardy. We have had both kinds. The former have nearly all died out. The latter has proved to be one of our finest and most reliable shade trees. It has large, heart-shaped, pointed, entire leaves and showy flowers, white, "tinged with violet and dotted with purple and yellow in the throat," pods pendant, eight to eighteen inches long.

Besides the difference in the hardiness of these trees, the Catalpa *speciosa* grows more upright and symmetrical, the top being more compact, attains to a much larger size, it blooms two weeks earlier, bears larger, whiter, and more showy flowers, has larger and longer pods, heavier and broader seeds, that are "decidedly winged and fully fringed at both ends." "The bark of the *bignonioides* in maturer trees is light gray, scaley and easily detached in small, thin plates. The bark of the *speciosa*, while light gray in young trees, becomes darker with age, adheres firmly, and is furrowed and rough." The former becomes a tree of one to two feet in diameter, while the latter is a great forest tree, attaining occasionally a diameter of three and four feet, and in the woods raising to a great height, sometimes fifty feet without a limb.

The wood of the Catalpa *speciocia* is said by the best authorities to be almost indestructible. If sawed into blocks of proper size, it would probably make the best wood pavement in the world.

Unfortunately the distinction between these two varieties or species is not apparent till they are too large to transplant; hence we must rely on the integrity of the nursery men who raise them from the seed. They now have no excuse for deceiving us, as every intelligent nursery man is supposed to be posted as to the difference between the two kinds of the Catalpa.

The Soft Maple is a rapid grower, a clean, elegant tree, but is very brittle. The limbs are liable to split from the body and break off. In their native forests they grow close together, tall and slender, and protect each other from the wind; the tops are smaller and the limbs less liable to break. The bark is tender when young, and requires careful protection. Much fault has been found with this tree and it has serious faults; yet, the fact that it will grow, and grow rapidly, and speedily make shade and is a handsome tree withall, are qualities which will always keep it in the front rank as a shade tree in this place. It is somewhat subject to the inroads of the borers. They have lately been attacked by a barklouse—the *Lecanium acericola* —which has destroyed some trees and injured others in certain sections of the city. It first made its appearance in 1874, but not much damage was done by it last summer. It may pass away as other noxious insects have done before. The Soft Maple prefers rich bottom lands, but will grow almost anywhere.

The Box Elder is a medium sized tree, having a medium growth, and while young a tender bark, but if protected does well and is quite hardy. Like its relative, the Soft Maple, it is sometimes injured by borers. It bears cultivation well and is a handsome tree anywhere, but in the river bottoms where it luxuriates, it is very beautiful, and makes a rapid growth. On moist, rich prairie land but few trees grow more rapidly or present a finer appearance.

The White Elm is, perhaps, the most famous of our American shade trees; but, in this dry soil, it will not develope its full proportions, therefore it must take a second place. Its top is apt to become open and unsymmetrical, and it is sometimes seriously injured by bark lice. For a few years after it is set out, it grows slowly, but finally improves and grows quite rapidly. It is so well known that it needs no especial description.

In certain localities it flourishes well. In all that —sag immediately under the bluff—it can be relied on and develops well. In a few other places where the ground is moist underneath, it holds no second rank.

The European Elm requires the same kind of soil, the same conditions, is equally hardy, grows as fast, makes a tree of about the same dimensions and is preferable because the top is more upright and compact, therefore making a denser shade.

The European and American Linn are elegant trees and do well. The former is the more handsome of the two, and merits more attention than it has received. It is preferable because it is equally hardy and the top is more compact. The Linden is a historic tree, and around it many romances have been woven. Its foliage is elegant, and when in flower it is the most fragrant tree in the temperate zone. The honey bees luxuriate on it, and honey made from its flowers is more delicious than any other honey in the world.

The Lombardy Poplar—*Populus dilatata*—is a unique tree, a rapid grower, rather handsome, but is very short lived. It is a native of Persia and probably other parts of Asia. It grows there and in Europe, where it has been introduced and extensively cultivated, to a height of one hundred and one hundred and fifty feet. In this country it rarely grows more than

from fifty to seventy feet high, with a top not more than ten feet in diameter. None but trees bearing staminate flowers have been introduced into this country; therefore it must be propagated by cuttings. It will grow in any soil. In places where the streets have been graded down into the pure sand, plant Lumbardy Poplars and they will grow. When they begin to die at the top, saw them off eight or ten feet from the ground and they will renew themselves with wonderful rapidity.

The Sycamore is a stately tree, and should, by no means, be neglected. It prefers moist, rich land, but does reasonably well here.

The Green Ash—*Fruxinus viridis*, a native of our forests, is a handsome, medium sized tree, and grows reasonably well. In places that are not too much exposed it is well worth planting.

The European White Birch is a fine ornamental and hardy tree. It will thrive in the dryest and most barren soil. The cut-leaf variety is very ornamental. It does not make much shade, and is well adapted to inside planting in any part of the city.

The American White Birch—*Betula populifolia*—which should probably be regarded as a variety of alba, is also an ornamental tree, will thrive in the same soil and is well worthy of cultivation.

The Hard Maple.

We are not now discussing the relative merits or demerits of trees as trees, but their fitness for our purpose. For beauty and durability, the Hard or Sugar Maple—*Acer saccharinum*, stands among the very first forest trees of America or the world, but unfortunately, except in a few places, it will not live between the bluff

and the river. From the early days of Peoria to the present time, it has been tried again and again, and has almost invariably failed.

It can only be relied upon in those localities above indicated for the elm, that is in that depression, or sag under the bluff, and a few other places where there is a moist subsoil.

The Kentucky Coffee Tree, or as it is commonly called, the coffee nut tree—*Gymnocladus Canadensis*, we would especially recommend for the beauty of its foliage. In this respect, it has no equal in our forests, and but few superiors in the world. It has very large decompound leaves, with a multitude of graceful leaf lets. It is usually a small tree, but sometimes attains to considerable size.

The Horse-Chestnut—*Æsculus hippocastanum*, a native of Asia, cultivated extensively in Europe and America for a shade tree, is quite ornamental and hardy. It grows slowly while young, but after a few years its growth is quite satisfactory.

The Burr Oak, Over-Cup or Mossy-Cup White Oak —*Quercus macrocarpa*, is the only native oak which will bear cultivation in a city. It prefers rich soil, but will grow anywhere except where it is too wet. It is one of the most hardy trees we have. It will bear much abuse and live. It is a handsome tree when young, and the larger it grows the more stately it becomes. The only serious objection to it is the very slow growth it makes.

The frontis-piece represents a typical Bur Oak shade tree. It grows in the front yard of the Work House and is worth driving many miles to see. It is sixty-three feet high. The trunk three feet above the ground measures sixteen feet in circumference. The

trunk divides just above this point. One of the divisions measures ten feet in circumference and the other one nine feet in circumference. A branch from the larger division comes off four feet from the ground, which measures five feet and three inches in circumference. The top is seventy-four feet in diameter, which gives it a circumference of two hundred and thirty-two feet. It is healthy and vigorous and presents a grand and imposing appearance.

Trees on the Bluff.

On the bluff we are not restricted as we are under it. All the trees recommended for below will do well here and most of them much better. Here the hard maple and the elm assume their proper place in the front rank. Here they have no superiors as shade trees. They are clean, hardy, long lived and always beautiful.

The Norway Maple—*Acer platanoides*, is a splendid tree, with a well rounded dense top, and a profusion of foliage. There is no tree more hardy. It is a native of northern Europe. It grows faster than the hard maple, its foliage is more dense, it puts out its leaves earlier in the spring and holds them later in the fall. We cannot too strongly recommend it.

There are several other varieties of maples cultivated and sold by the nursery men. Some of them are highly ornamental, and all are hardy.

The Cucumber Tree—*Magnolia acuminata*, is a large and elegant tree, growing sixty to eighty feet high. It is perfectly hardy and in rich land grows rapidly. It is a native of Western New York, Pennsylvania, Kentucky, Tennessee, Southern Ohio and Indi-

diana. Leaves petioled, eight to fourteen inches long, six to eight inches wide, oblong-lanceolate, acuminate, entire, smooth above and downy beneath, conspicuously ribbed. Top pyramidal and symmetrical. It is but little known here, but a few having been introduced. It is one of the very finest ornamental shade trees, suitable for any part of the bluff and for Central Illinois generally. It can be procured from almost any of the nurseries, and I hope many more of them will be introduced.

The Mulberry—*Morus ~~nigra~~*, is a fine little indigenous tree. In rich land it attains to considerable size, but is ordinarily a small tree. It is well worthy of cultivation.

The Black Walnut is a large forest tree, and where it is not trampled about, and there is not too much smoke and dust, does well. It is one of the finest trees in the world for timber, but in a city is not well adapted for a shade tree.

The Black Cherry—*Prunus cerotina*, is an elegant little tree, somewhat tender, but with reasonable care will grow and make a beautiful shade tree. It fruits early, and one tree will bear all the fruit any family will want for making cherry bounce. The tent caterpillars choose it before all other trees, but they do no harm until after they begin to build their tents, then they are easily destroyed.

The Honey Locust—*Gleditscha triacanthos*, is a large forest tree growing from eighty to one hundred feet high. It does not give much shade, but it is a most graceful and ornamental tree. Its leaves are pinnate and bi-pinnate, with very small leaflets, which are a deep, rich green color. The general aspect of the tree is so different from any other of our trees, and its foliage is so graceful, that it always attracts attention.

There is a variety which is thornless, or almost so, which is preferable to those which are full of great thorns.

The *Betula papyracea*—Canoe Birch, the bark of which the Indians used for making canoes, is a handsome tree, grows rapidly on rich prairie soil, and would do well on the bluff.

The Black, Yellow and Red Birches are all natives of the northern part of the United States and Canada, are all handsome trees; prefer moist, rich land, and do well here.

The Sassafras is a handsome little tree, hardy and well adapted for inside planting, either on or under the bluff. It is the only representative of the Laurel family in this vicinity. Every part of the tree is aromatic, especially the bark and leaves.

The Butternut or White Walnut is rather a handsome little tree, and does well inside where there is not much smoke and dust.

The Mountain Ash is worthless under the bluff, but in some protected places on the bluff, has done reasonably well. It is too handsome to discard altogether.

The White Willow—*Salix alba*, is a good tree, a native of Europe, a rapid grower, and flourishes here.

The Persimmon cultivates well, and is a fine little shade tree.

The common Silver Leaf Poplar grows rapidly almost anywhere, but on exposed places is short lived. It is subject to borers and sprouts dreadfully.

The Cottonwood is a rapid grower and flourishes in any moist soil, but cannot be regarded as a choice tree.

The Yellow Poplar, or Tulip tree—*Liriodendron tulipifera*, winter-kills and is unreliable. In some protected places a few have grown to considerable size and are still healthy and vigorous, but nearly all that have been put out in the city are now dead.

The Pecan has been highly recommended, both for a shade and fruit tree. How this may be I cannot say from observation. I hope it may prove to be an exception to the hickory family, of which it is a member, as it is a useful and ornamental tree.

The Ailanthus kills back in the winter and cannot be recommended.

The Black Locust has, fortunately, been killed by borers. It is a rapid grower but not a choice tree.

Fruit trees are not desirable for shade trees in a city. The Apple, Peach and Cherry, especially the two latter, are short lived. The Pear tree lives longer, but the heat, smoke and dust of cities injure them all, and prevent them from fruiting well.

The Chestnut tree has done badly and cannot be recommended.

Coniferæ.

1. DECIDUOUS.*

The Larix, or Larch. is a cone-bearing tree, with needle shaped leaves, but not an evergreen.

The Black Larch, Hackmetuck, Tamerack—*Larix Americana*, grows in swamps in the north and northwestern portions of the United States, and further north it is found also on uplands. It flourishes on our prairies; will also do well on the bluff, and is a handsome tree.

The European Larch—*Larix Europœa*, is a native of the mountainous parts of Europe, and the south of Russia. It is extensively cultivated in England and on the continent of Europe for timber and ornament. Its timber is among the most durable and valuable in the world. It is a rapid grower and very ornamental. It is one of the most reliable and desirable trees for planting on the bluff.

2. EVERGREENS.

Under the bluff, except in a few spots where clay is mixed with the subsoil, all evergreens have failed, and will continue to fail. They live and thrive a few years and then die for want of nutriment. They literally starve to death. We do not know how to supply the deficient nourishment, and if we knew, it would probably cost too much to be practicable. But on the bluff a few species will succeed.

The Scotch, Austrian and White Pine may be recommended.

The Scotch Pine—*Pinus sylvestris*, is the least ornamental of the three; but it is so hardy, grows so well,

*Trees that shed their leaves annually.

and is so easy to cultivate, that in a place like this, where so few evergreens will flourish, it is worthy of notice and should be planted. It constitutes a large part of the forests of Northern Europe, and makes the best of timber.

The Austrian Pine—*Pinus Austriaca*, is a native of the mountainous regions of Austria, where it grows to the height of one hundred to one hundred and twenty feet. It is more ornamental than the last, and is equally hardy, but requires more care in transplanting. As it becomes a large tree, and is a rapid grower, it should not be crowded, but have an abundance of room. The same may be said of the White Pine and the Norway Spruce.

The White Pine—*Pinus strobus*, is so well known it needs no description here. In Pennsylvania, New York, New England, Michigan, Wisconsin and Minnesota it has been very abundant, and in parts of Michigan, Wisconsin and Minnesota it still is. It is the tree from which our common pine lumber is made. It is one of the most graceful trees of the pine family. If it were a rare foreign tree, its beauty would be appreciated. It grows well on the bluff, and should be more extensively cultivated for ornament.

Perhaps it may be proper to add the Yellow Pine —*Pinus mitis*. It is rather a pretty evergreen and will grow on the bluff.

The Norway Spruce—*Abies excelsa*, is one of the finest of evergreens. It is a lofty forest tree, indigenous to Northern Europe and Asia, and further south among the mountains, where it is very abundant. It lives to a great age. It is said by Michaux to require one hundred and fifty years to develop its full proportions. Bryant, in his work on forest trees, says: "No other evergreen is more easily raised from seed; no

other is more cheaply obtained from nurseries; no other is more successfully transplanted. It is perfectly hardy; its growth is vigorous and rapid; its branches and foliage dense and compact, and it readily adapts itself to a variety of soils and climate. Its lower branches are persistent; its growth is perfectly upright, and where room is allowed, it pushes its limbs out in all directions, in defiance of the force of the wind."

The Hemlock—*Abies Canadensis*, is a graceful tree, with dense, dark green foliage, a native of the colder parts of the United States and Canada. It will doubtless thrive best where it is somewhat protected from the sun.

Bryant says of it: "Although despised as 'common' by many in the countries where it is native, the Hemlock has few, if any, equals among evergreens as an ornamental tree."

The Balsam Fir—*Abies balsamea*, is handsome while young, but is short lived and of little value.

The Red Cedar—*Juniperus Virginiana*, does reasonably well on the declivities of the bluff. Its growth, however, is very slow, and in the winter its foliage becomes dark and dingy.

The Dwarf or Ground Juniper—*Juniperus communis*, and the Swedish and Irish Junipers, which are varieties of this species, is an evergreen which we must not overlook or neglect. It might have been placed among the other shrubs, but I prefer noticing it here. It is a prostrate or ascending shrub, with a profusion of branches spreading in all directions, and is very ornamental. It will flourish on the most exposed gravelly and barren knolls of the bluff, where few other things will grow. If extensively planted in these

places, it would relieve them of their barren aspect, and add much to their beauty. They may be obtained at most of the nurseries.

The Arbor Vita—*Thuja occidentalis*, is the best evergreen for ornamental screens and hedges. It prefers rocky places, the borders of streams or swamps, but grows well on the bluff, as it does on prairie soil generally.

Doubtless other evergreens will grow here, and I hope more may be introduced on trial, but the success of those we have named is already an assured fact.

Transplanting Deciduous Trees.

In this climate, all transplanting of trees should be done in spring. They should be neither too large nor too small, but about medium size. If they are too large they will not do so well, and if they are too small it involves an unnecessary loss of time. They should be dug up carefully, and plenty of roots taken with them. The roots should be exposed neither to the sun nor cold air, nor be allowed to dry. Many trees are ruined in this way before they are set. Never buy or receive trees that are brought into the city with the roots exposed, unless it is a cloudy, damp day, and you know they have been recently dug. The roots are necessarly more or less broken and cut off, the top should be cut back in proportion, so as to maintain an equilibrium between them. They should be set the same depth or a little deeper than they originally grew. Each root that is broken should be cut smoothly with a sharp knife, sloping from the tree outwards, with the cut surface downward. The hole should be large, and when the tree is set in it, filled with fine earth to near

the surface, taking care that the rootlets are well spread out and put in their natural position, then fill up with water, and while it is settling, work the tree up and down, so that every crevice will be filled with earth, in a semi-liquid state; in this way, every root will come in immediate contact with the soil. This is one of the most important things to be observed in setting a tree. Then fill the hole to a level with the surrounding earth and mulch with old straw, rotted leaves, or (what is equally good) four or five inches of sand, this will retain the moisture till the roots grow and acquire strength to support themselves. One or two quarts of oats, or one-half peck of potatoes put in the bottom of the hole before the tree is set, will assist in retaining moisture about the roots.

The bodies of trees need no sunlight. They are better without it. In their native state they are usually protected by their own branches, and by other trees when young, and as they grow older their own tops shade them. The bodies of many young trees are killed by the sun, chiefly in July and August, on the southwest side. To obviate this it is a good plan to nail two narrow boards together so as to make a quarter box, sharpen the lower end and drive it in the ground, having it high enough to reach the lower limbs, placing one wing of this box on the south side and the other on the west side of the tree. This is all the protection from the sun they need, and will save many trees which, without this protection, would be killed by the sun, or so seriously injured they will eventually break down.

For the first few years it is better to spade around them every spring, and mulch them. In the fall, when the leaves drop, leave them under and around the trees, they give protection to the roots and nutriment

to the soil. Leaves should never be removed from our lawns or grass plats, as they protect the grass in winter and enrich the ground more than anything else that can be applied.

When trees are set in rows, each row should be of the same kind. Planting different species in the same row, especially alternating them, destroys the effect and shows bad taste. In a large ground or park, where they are planted promiscuously, in imitation of nature, a judicious mingling and grouping of different species is in good taste, and gives the whole a natural and pleasing appearance.

Transplanting Evergreens.

The same principles that apply to the transplanting of deciduous trees, apply also to evergreens, but greater care is necessary to insure success. There is one difference, however, the tops should not be cut back. The roots must not be exposed to the sun, to drying winds, or to cold. As soon as the tree is taken from the ground its roots should be dipped in liquid earth, and then covered with wet canvas, moss or straw, so as to retain the moisture until it is reset. A failure to observe this will be likely to injure, if not ruin it. Cloudy weather is the better time to transplant all trees, especially evergreens.

It is better to transplant evergreens while small, as they will then make better trees, and are less liable to die. All authorities agree that they should not be transplanted during the growing season, and most of them agree that here in the west, the best time is in early spring.

Pruning Deciduous Trees.

As a general rule, the less shade trees are pruned the better. Nature will form a better top and a more harmonious tree in all its parts than art. Severe pruning is no longer practiced even in fruit orchards by our best horticulturists. The custom that formerly prevailed, of pruning evergreens and other trees, so as to make top-shaped, ovate, and other fantastic tops, is no longer regarded as showing the best taste. If you want a tree with a low spreading top plant one that grows that way. If you want an ovate or pyramidal top, plant a tree that will make such a top, but do not attempt to force trees to assume different forms from those which nature gives them.

The true idea is to make each species assume as nearly as possible the typical form of that species. To do this, some pruning is sometimes necessary. If trees are not crowded—if each one has room enough for the air and sunlight to have free access to it on all sides, it will round out and develop its full proportions, and if it does not actually attain it will approximate its typical form. Where the lower limbs are in the way, of course they must be sacrificed, but where they are not, leave them and you will have a finer and more thrifty tree. If a limb, as is often the case with the elm in our dry soil, extends beyond the rest, absorbing the strength and destroying the symmetry of the tree, it should be cut back while yet small.

The Soft Maple often throws out limbs which have no firm attachment to the body, and will sooner or later split off; these should be removed while small. The idea of cutting back the top of a soft maple, or any other tree, to prevent it from becoming top-heavy, is fallacious; it relieves for the time, but makes it

worse afterward. If a Soft Maple, as some of them will do, breaks bodily, and continues to do so, it is better to remove it and plant another in its place. Severe pruning lowers the vitality of any ordinary tree, making it less able to bear the drouth and heat of summer and the cold of winter, and leaving it an easy prey to borers and other noxious insects.

As a strong man is able to resist disease, so a vigorous tree is able to resist the attacks of its enemies, while a feeble one succumbs.

So far as possible all limbs should be removed while small. It is rarely necessary to cut a large limb from a tree that has been properly cared for.

The Time for Pruning Deciduous Trees.

On this question there is much difference of opinion among tree-growers. Some contend that late autumn is the best time; others, that it should be done while the tree is in its most vigorous growth, say in May or June; others again, in the early part of the growing season, when the young leaf stems first show themselves. I think the last is the most favorable time, for then we have almost the entire summer's growth to heal over the wound. All agree that the worst possible time is in early spring, just when people usually prune. If pruning is done at this time, as soon as the sap begins to flow, it exudes from the wounds, weakens the tree, and is apt to cause the wood to decay. Trees recently transplanted are an exception, they do not suffer in this way, and for special reasons, usually require more or less pruning when set out. The wound left after removing a large limb is best treated by a mud plaster, bound on with cloth. Wax, which is often recommended, becomes heated

by the sun, and is liable to irritate and blister the parts around the wood. The wounds that are made in cutting off small limbs need no application.

There is usually a ridge, called the collar, around the base of each limb. It has been a subject of dispute whether this collar should be removed with the limb, or left on and the limb cut outside of it. I prefer removing it. If it is not removed it is apt to die down to the body of the tree. There are often latent buds in this collar which develop when the limb is taken off. Though in removing it the cut surface is a little larger, yet it heals over quicker and smoother, and there is no sprouting around it.

Pruning Evergreens.

Deciduous shade trees require little pruning, and evergreens still less. The beauty of an evergreen is spoiled when the lower limbs are removed. If any of the side branches become irregular, or grow out of proportion, they should be shortened. If the tree throws up two or more leaders, all but one should be removed. If the leader is lost, it may throw up a new leader itself. If it does not, "it may be restored by lashing a rod to the stem of the tree, and tying one of the side shoots to it, in a position as nearly upright as possible." If this fails, dig up the tree and put another in its place.

General Directions for Setting Shade Trees

All trees, to develop into perfect shade trees, require the sunlight and fresh air all around them. If trees are planted for timber they should be placed near together, and in large bodies. Then, to obtain sun-

light and fresh air, they are forced upward, the lower branches, which are deprived of these, dying. This makes a tall trunk and small top, just what we do not want in shade trees.

Too many trees should not be set round a house, and no large trees should be set near it. A certain amount of sunlight and plenty of fresh air are necessary to health. If there is too much shade both are obstructed and the premises become damp and unhealthy. If large trees are placed near a house it renders topping of them necessary in a few years, and afterward cutting back from time to time. This treatment always injures trees. Shrubbery comes in here of various kinds and sizes, to suit the taste of the owner, or small trees, as the Mulberry, Wild Cherry, Sassafras, Persimmon, Coffee Nut, etc.

No yard should be crowded with small trees or shrubbery. A few of them, well chosen and well arranged, shows better taste and presents a finer appearance. A clean grass plat is hard to beat.

In setting trees due regard should be had to the size they will naturally attain. The larger trees, as the Maples and the Elms, should be twenty or twenty-five feet apart, smaller ones require less space. The Lombardy Poplar grows very tall, with a remarkably long and slender top, rarely becoming more than ten feet in diameter; therefore, they may be, when put in a row, set ten feet apart, and still give the trees ample room to develop into their full proportions.

If trees are set in this way, that is far enough from our houses, and given plenty of room, and then never trimmed to any extent, they will be handsomer, more healthy and vigorous than they can possibly be by any system of severe pruning.

Indigenous Shrubs.

There are, in this vicinity, a number of ornamental shrubs to which I wish to call attention. They are not appreciated for two reasons; first, though growing around us, they are scarcely known, and; second, they do not come from Europe, China, Japan, or some other foreign country.

The June Berry, Service Berry, Shad Bush—*Amalanchier Canadensis*, is intermediate between a tree and a shrub, attaining to the height of from fifteen to twenty feet, belongs to the Rosaceæ family, has a graceful form, clean bark, and beautiful foliage. It covers itself in early spring, before the leaves are out, with a profusion of racemes of white flowers, which are very beautiful. It bears an edible berry, about the size of a huckleberry. It grows on the river hills above Prospect Hill, across the river among the bluffs, and also on Kickapoo Creek. It is hardy, and few shrubs are more ornamental.

The Red Bud—*Cercis Canadensis*, is a large shrub, or small tree of the Leguminosæ order, with large, heart-shaped, smooth, entire, pointed leaves, and in early spring before the leaves appear, bears a profusion of red-purple flowers. It is clean, free from insects, holding its leaves till late autumn. It prefers rich soil and is easily cultivated. It is common in this vicinity, and deserves more attention than it has received.

There are three species and a number of varieties of the Red Haw in this vicinity, *Cratagus coccinea, tomentosa* and *Crus-galli*, all of which are worthy of cultivation. They are large and very hardy shrubs, some of them attaining to the size of small trees. They all bear white flowers in the spring, and red berries in the

fall. They belong to the Rosaceæ family, and are no mean representatives of it.

The Black Haw—*Viburnum lentago* belongs to the Honeysuckle family, and is a large, handsome shrub. It bears some resemblance to the Snowball. It blooms in May and June, flowers white in large flat compound cymes. It will grow in any soil, but prefers rich loam.

The Staff-tree, American Bludder Nut—*Staphylea trifolia*, is one of my little favorites. It grows in thickets, usually on moist hill sides, eight or ten feet high, slender, with greenish striped branches, trifoliate leaves, pendent racemes, of greenish-white flowers, pods membraneous, inflated three lobed, about an inch long and three-fourths of an inch in diameter. It should be set in a shady nook, and allowed to grow in a clump.

The Red-osier—*Cornus stolonifera*, is found in boggy places, but will grow in any moist soil. The branches and long, slender annual shoots are bright red-purple, very handsome. It multiplies freely by subterranean suckers, and forms broad clumps six to ten feet high. It bears white flowers in June, and white to lead-colored fruit in the fall.

The *Cornus alternifolia*—Alternate Leaved cornel, is a little taller shrub, found on hill sides in copses, with slender, greenish branches, broad cymes of handsome white flowers, and pretty foliage, the whole presenting a graceful appearance.

The *Amorpha fruticosa*—False Indigo, grows in moist places on the banks of streams, is common around here, and should be introduced in our grounds. It belongs to the Leguminosæ family, has pinnate leaves, and clustered, terminal spikes of violet purple flowers. As found in this vicinity, it is usually six or eight feet high, but it is sometimes much taller.

The *Euonymus atropurpureus*—Waahoo, Burning Bush, is common in our woods and thickets, will grow in sunshine or shade, but prefers partially shaded places. When fully developed it is from ten to fifteen feet high. It is a pretty shrub, with green, four-sided branches, and bears panicles of little purple flowers. In autumn, when covered with its deeply lobed, crimson fruit, drooping on long peduncles, it is very ornamental. It requires little room, and will do well in places that are so shaded nothing alse will grow. It should be sheltered from the north wind.

The *Euonymus Europœus* is cultivated and highly esteemed a little further south, but is not quite hardy here. Our *Euonymus* is almost as handsome and is hardy, though it flourishes best in protected places.

The *Euonymus Japanica* is a common greenhouse shrub.

The common Sumac—*Rhus glabra*, is so common we do not realize that it is pretty, yet it is, and should be in every one's grounds. It always grows and looks fresh, never becomes large, and lives to a great age.

The Aromatic Sumac—*Rhus aromaticus*, grows from four to six feet in height, is ascending, inclined to spread around loosely, has pretty aromatic foliage, and spikes of little yellow flowers appearing before the leaves in early spring. These flowers, like the flowers of the soft maple, and many other plants, are formed during the fall, and have only to expand when the warm weather comes in the spring. It loves dry, gravelly places, and will flourish where nothing else will. These two species of Rhus belong to a poisonous family, but are irnocent members of it.

Indigenous Vines.

Vines are my favorites. No grounds are complete without them. Nature never plants a park without interspersing it with vines. There is a peculiar grace and beauty—a charm about vines, that pertains to nothing else. They are the poetry of the forest, the emblem of affection, the companion of love. In her distribution of them nature has not forgotten us. Let us not forget them.

The *Ampleopsis quinquifolia*—Virginia Creeper, is a woody vine of vigorous growth, climbing to the tops of our highest trees. It will cover the side of a brick or stone house, clinging to the walls by its tendrils, which do not penetrate them but adhere to the surface by little discs, on atmospheric principles, just as a tree frog holds to a tree. They become so firmly fastened they will break before they loosen their hold. It has five leaflets, and may thus be distinguished from the Poison Ivy, which has but three. It is well suited for covering large arbors.

The common wild grape vine, though worthless for fruit, makes a good covering for arbors. It is better for this purpose than the tame grape, because it is more hardy and grows more rapidly. This and the Ampleopsis belong to the same family.

The *Tecoma radicans*—Trumpet Creeper, Trumpet Flower, is a beautiful woody vine, very hardy, a rapid grower, with pinnate leaves, leaflets five to eleven, flowers two to three inches long, orange and scarlet, very showy. This vine may be trained into any shape that is desired. It will grow almost anywhere. It merits more attention than it has received. Hundreds of them may be obtained in the river bottom.

The *Celastrus scandens*—Wax Work, Climbing Bittersweet, False Bittersweet, is a hardy woody vine, common in our woods, and should be cultivated more in the city. The leaves are medium sized, ovate oblong, finely serrate pointed. "The opening orange-colored pods displaying the scarlet covering of the seeds are very ornamental in autumn," and remain so till the middle of winter.

The *Menispermum Canadense*—Moonseed, Yellow Ferrilla, is a handsome little twiner with smooth bark and large pretty leaves, loves rich soil and shady places. It is one of the modest little things that no one can observe without admiring. It is common in thickets in rich bottom land. The stem is smooth and slender. It bears panicles of delicate little yellowish white flowers in summer, and little round clusters of purple fruit in autumn, but its chief beauty is its foliage.

The *Clematis Virginiana*—common Virgin's Bower, is not uncommon in thickets around Peoria. This vine is a little woody, but chiefly herbaceous; therefore dying back in winter, but each year throwing out a vigorous growth. It is a profuse bloomer, flowers white, and the fruit plumous with conspicuous feathery tails that are curious and ornamental.

The *Dioscorea villosa*—Wild Yam, is the most elegant of our indigenous vines. It is the rare beauty of our woods. No one can see it without admiring it. It is a delicate herbaceous vine. It loves the thickets, is modest and retiring. If it came from Japan it would be esteemed and cultivated. It grows around us and we scarcely know it. "Verily, a prophet is not without honor save in his own country." It is the only representative we have of the *Dioscorea* or Yam family. It is an endogen with net-veined leaves, which is an exception to the rule. The flowers are not conspicu-

ous, greenish yellow, the sterile in drooping panicles, the fertile in drooping simple racemes, the fruit three angled or winged, pods nearly an inch long, stems slender from large knotty and matted rootstocks.

The *Adlumia cirrhosa*—Climbing Fumitory, Mountain Fringe, is not indigenous to this vicinity, but is found in the eastern part of the state, Indiana and Ohio. It is a handsome climbing biennial vine with delicate foliage, thrice pinnate leaves, cut lobed little leaflets, and ample panicles of prooping pale, flesh-colored flowers. It climbs over high bushes, and in cultivation makes elegant festoons and bowers in shady places. It may be obtained at Mr. Frederick's greenhouse.

There are many foreign shrubs and vines which are hardy and highly ornamental. These may be noticed at some future time, but they do not come within the scope of this paper.

General Remarks

If our streets were lined with shade trees, and our yards properly set with shrubbery and vines, they would absorb much of the carbonic acid gas that generates in excess in all cities and places where great numbers of men or animals congregate. They would perceptibly modify the intensity of the heat and dryness of the atmosphere in summer, and add much to the healthfulness, comfort and beauty of the city.

It is well known, that in summer much of our sickness, especially among children, is caused chiefly by intense heat. Reduce the temperature, and you will lessen the percentage of mortality from cholera infantum and allied diseases of children. Our broad, naked, sandy streets; our unnecessarily broad, brick

sidewalks, the walls and roofs of our houses, reflect the heat from the burning rays of the sun until the whole atmosphere at times becomes like a heated oven. No wonder many persons become suddenly sick and die. No wonder multitudes of little children, the light and hope of the family, succumb, and our cemeteries are dotted all over with little graves.

Except in the business part of the city, one-half of all our wide streets should be converted into grass plats and flower beds and set in trees. Every property owner should be requird to care for and protect these grass plats and trees the same as and even more than his sidewalks.

Most of our streets are eighty feet wide. Make a drive-way in the center thirty-five feet wide, which for this purpose is now and always will be enough, pave or gravel them, make the sidewalks eight feet wide, which will give ample room, and leave the intervening space on either side for grass plats, flower beds and trees, and we will have streets that are convenient and present a tasteful and elegant appearance. Or what in some of the streets would be better, make the grass plats in the center of the streets and have a drive-way on each side of them.

It is strange people have not before this learned that such broad, bare drive-ways are unnecessary in the resident part of any city. Give at least one-half of all the streets to green grass, flowers and trees, and we add immeasurably to the comfort, healthfulness and beauty of the city and have ample room for driving every where.

When this is done, and the trees have had a few years to grow, the increased heat our improvements have made will be materially modified, and our death rate lessened in proportion.

I am happy to say that this good work is begun, and I hope it will continue until it is extended throughout the city. Then with our location and surroundings, which for variety and beauty are unequalled, surely not surpassed, and with the general cultivation of good taste, to which these will lead, we will have one of the most cheerful and pleasant cities in the world.